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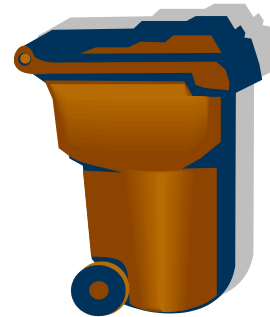
Comparable to Source Separation?

CalRecycle Workshops on
MRF Performance Standards
July 16th and 18th, 2013





**A walkthrough of an approach for
determining if Mixed Waste
Processing Facilities (MWPFs) are
comparable to Source Separation**



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Focus:



- Focus of this workshop is “comparable to source separation.”
- Need to meet Mandatory Commercial Recycling (MCR) statutory requirements (AB 341).
- Our proposal addresses “comparable to source separation” - but it could also serve as a starting point for developing a standard for “post-recycled residuals” feedstock for uses like thermal processes.
 - Will have other workshops on MRF residuals as feedstock later.

Comparable:



To be comparable to source separation, a MWPF must be about as effective at removing recyclables when compared to the source separation collection and processing system:

- Recycling (blue bin),
- Organics diversion (green bin),
- Disposal (black bin) &
- Subsequent Processing.

Background:



- Two main schools of thought:
 - Rigorous & quantitative vs.
 - Holistic & qualitative.
- Many possible hybrid approaches too.
- Prior discussions = no consensus.
- Time to move from ideology to specifics.

Criteria for any Proposal:



- A. Meets the law.
- B. Shows recyclables removed comparably.
- C. Works regardless of feedstock/operations.
- D. Practical, doable & clear for all.
- E. Voluntary standard.
- F. Minimizes unnecessary facility impacts:
 - Respects proprietary information.
 - Not too invasive, costly or disruptive.

We Considered Your Alternative Approaches



1. All MWPFs comparable to source separation.
2. No MWPFs comparable to source separation.
3. Qualitative review of all diversion efforts.
4. Qualitative checklist of MWPF activities or best management practices.
5. Use overall MWPF recovery rate.
6. Continuous quantitative MWPF monitoring.

1. & 2. All or None Comparable



1. **ALL.** Some suggest that all MWPFs are superior to source separation because:

- They have access to the entire waste stream,
- Do not require generator education, and
- Can react more quickly to market changes.

2. **NONE.** Some suggest that all MWPFs are inferior to source separation because:

- Their feedstock is too contaminated.
- Lower recovery.
- Lower quality recyclables.

1. & 2. All or None Comparable



Did not pursue because:

- ✓ Not enough data to support either.
- ✓ No consensus on either.
- ✓ Stereotypes not useful - tremendous variation within source separation systems and within MWPFs.
- ✓ Overlap in effectiveness levels.
- ✓ Fails Criteria A&B.





3. Qualitative review of all jurisdiction diversion efforts.

If jurisdictions meet diversion mandates and have good programs overall, then should have flexibility on how and where commercial recycling takes place. If in compliance with MCR then deemed to have “maximum extent feasible” recycling. No data reporting required.

3. Qualitative review of all jurisdiction diversion efforts.



Did not pursue because:

- ✓ The statute requires a comparison of California's source separation system to individual MWPFs, not a general evaluation of efforts by jurisdictions (Fails Criteria B).



4. Qualitative checklist of MWPF activities.



Consider recyclables removed from mixed waste “to the maximum extent feasible” if waste goes to an integrated facility that recovers recyclables & some organics. Could develop a list of best management practices (BMPs) and standards to choose from. No data reporting required.

4. Qualitative checklist of MWPF activities.



Did not pursue because:

- ✓ Would not demonstrate effectiveness of recyclable recovery (Fails Criteria B).
- ✓ Would detail proprietary information on operating practices (Fails Criteria F).
- ✓ Feedstock & requirements differ so not 1 right answer in BMPs (Fails Criteria C).
- ✓ Who decides how MWPFs should operate & sets BMPs (Fails Criteria D).



5. Use overall MWPF recovery rate.



Quantitative, mixed waste processing recovery rate based on mass balance:

$$\frac{\text{tons received} - \text{tons sent for disposal}}{\text{tons received}} = \text{recovery rate}$$

- Target recovery rate = current statewide average.
- Focus on “below average” facilities.
- Facilities report data for mass balance, feedstock sources and types, and destination of all materials.

5. Use overall MWPF recovery rate.



Did not pursue because:

- ✓ Recovery rates vary based on feedstock, & local conditions (Fails Criteria C).
- ✓ Difficult to set a level playing field. (Fails Criteria D).
- ✓ More dirty loads could go straight to disposal to pump up recovery rate (Fails Criteria B).
- ✓ Would not show effectiveness to a comparable level – not specific to recyclables (Fails Criteria B).
- ✓ Would need different method and standard for residual uses like thermal processes.





6. Continuous quantitative MWPF monitoring.

Use authority in Public Resources Code Section 41821.5(b) for ongoing reporting to monitor inflows and outflows by material type at MWPFs. Implement monitoring and inspections by Local Enforcement Agency, Jurisdictions and/or CalRecycle staff.



6. Continuous quantitative MWPF monitoring.

Did not pursue because:

- ✓ Could divulge proprietary data (Fails Criteria F).
- ✓ Too invasive & costly (Fails Criteria F).
- ✓ Could interfere with operations (Fails Criteria C).



Our Proposal – A Preface:



- This is one way to do it – It's not perfect.
- Let's test drive it.
- Nothing (materials, rates, etc.) set in stone.
- Plenty of time to get it right.
- We know that the devil is in the details.
- We have tried to address some of the complexity but know there is more.



Our Proposal – Assumptions:

For discussion need some simplifying assumptions. We talk about:



1. **Blue bins.** But, it's complicated – new trends (e.g. wet/dry) emerge and things evolve.
2. **MWPF.** But, it's not just “Clean MRF” vs. “Dirty MRF” – many facilities with multiple lines.
3. **Residuals as Disposal.** But, it's not always simple flows – some flows through more than one facility.
4. **Many others.** Need to address in regulations.

Our Proposal - Concepts:

Two Numerical Standards



- **Standard #1 = Aggregate Selected Materials Recovery Rate.** A minimum recovery rate for selected recyclable materials. Percentage of selected materials recovered from the total amount of selected materials accepted.
- **Standard #2 = Aggregate Unrecovered Recyclables Rate.** A maximum level of unrecovered recyclables in residue. Percentage of aggregate unrecovered recyclables still in recoverable condition left in MWPF residue.

Our Proposal - Concepts: Certification



MWPFs that meet two numerical standards would be certified as “High Performing” (HP-MWPFs):

- HP-MWPFs are deemed comparable to source separation.
- Businesses served by HP-MWPFs would be in compliance with the Mandatory Commercial Recycling requirements (as are those with source separation programs).

Our Proposal - Concepts: Evaluation



To become certified:

- MWPFs must have independent, accredited evaluators determine if two numerical standards met (done initially and annually).
- MWPFs Certified if meet standards.

Our Proposal – Criteria A,B,&C



- ✓ Doable (Meets Criteria A).
- ✓ Two metrics with direct comparison (Meets Criteria B).
- ✓ Doesn't matter what else is coming in (feedstock), only recyclables going out – one way or other (Meets Criteria C).
- ✓ Technology, processing, operations don't matter – only end results (Meets Criteria C).



Our Proposal – Criteria E



- ✓ Would only apply to MWPFs that volunteer (Meets Criteria E), who:
 - Wish to be certified as a high performing MWPF (HP-MWPF).
 - Wish to be considered comparable to source separation.
 - Voluntarily submit to the requirements.



Our Proposal – Criteria E



- ✓ Would not apply to MWPFs that do not volunteer (Meets Criteria E). If a MWPF does not volunteer or fails to meet the standards:
- Jurisdictions could educate, monitor, & report.
 - Haulers could tell businesses & change service.
 - Businesses could ask for different service.
 - CalRecycle could post & publicize results.
 - CalRecycle could assist with grants & training to help facility meet standard.



Our Proposal – Criteria D & F



- ✓ Two simple metrics, clear measurement, quantitative, & easily understood (Meets Criteria D).
- ✓ Independent evaluator (Meets Criteria F)
- ✓ Aggregate data reported (Meets Criteria F).
- ✓ No meddling in operations (Meets Criteria F).
- ✓ Many MRFs already do characterizations for own use (Meets Criteria F).





Our Proposal - Issues



- Cost to MWPFs for evaluation.
- Getting agreement on terms & rules:
 - “Recoverable condition”
 - “Selected materials”
 - Granting waivers
 - Etc.
- Getting agreement on logistical details:
 - Isolating commercial residuals for measurement.
 - Approval of Evaluators
 - Etc.

Our Proposal - Further Development:



- Easier to edit than to create – let's edit.
- Plenty of time to get it right.
- Any approach would need regulations.
- Plenty of time and opportunity for stakeholder input.

Our Proposal – Details:



A. A set of definitions.



B. A certification process for MWPFs.



C. Two numerical standards.



D. An evaluation method for the standards.





A. Definitions.

How are we using these terms?

“Source separation system”



A source separation system:

- Generator segregates recyclables into “blue bins” (and “green bins”) with “black bins” for trash.*
- Recyclables are kept separate during collection, transport, & processing.
- Sorts or processes recyclables to be sold as commodities & meets quality standards for use as a raw materials for new products**

*See Title 14 CCR Section 18836 (7) of the Mandatory Commercial Recycling Reg.

** See Title 14 CCR Section 17402.5 (d) of the Minimum Standards Regulation.

“Comparable to source separation”

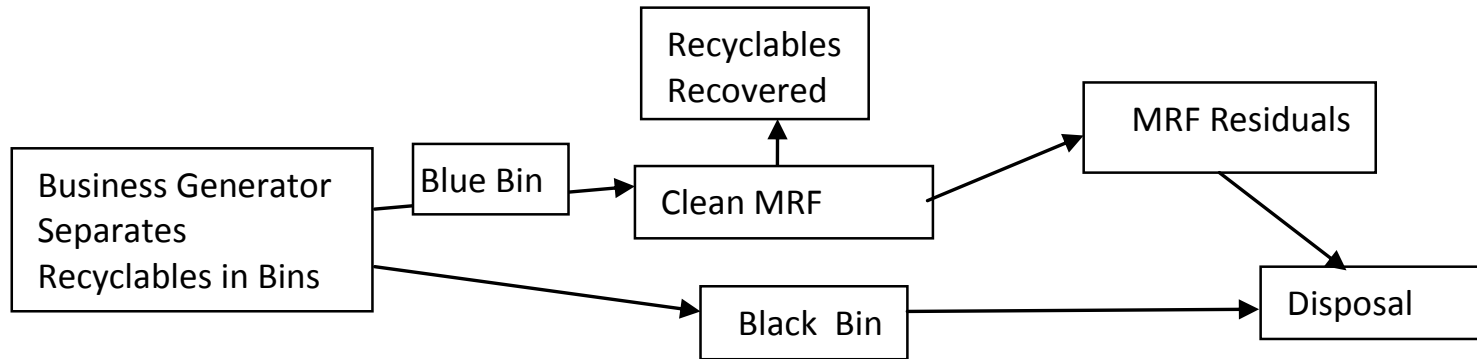


An HP-MWPF must be about as effective at removing recyclables when compared to the source separation system (black, blue and green bin service) & it leaves about the same percentage of recyclables in the amount ultimately disposed.

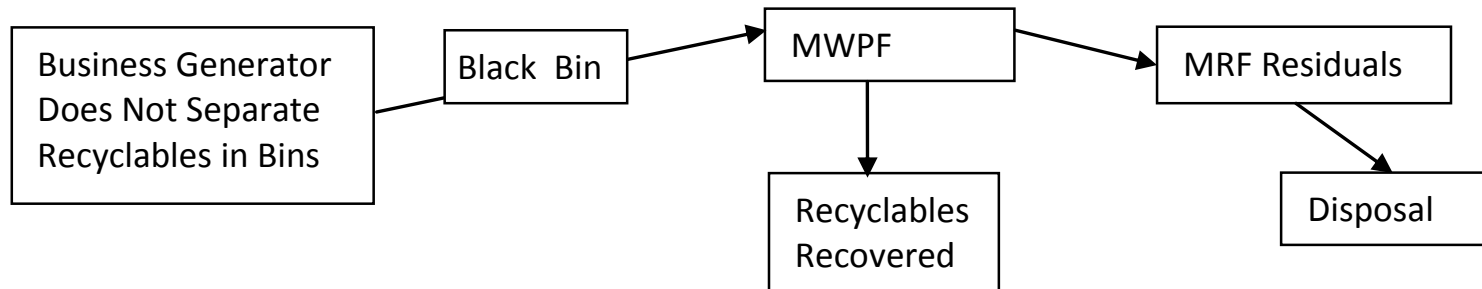
- Comparable does not mean equal.
- Compare systems not facilities.
- Compare to bin service.



Simplified Source Separation System



Simplified Mixed Waste Processing System



“Mixed waste processing facility” or “MWPF”



Means a permitted solid waste facility where solid wastes, that did not have recyclables separated at the source, are sorted or separated, by hand or by use of machinery, for the purposes of recycling.

“High performance mixed waste processing facility” or “HP-MWPF”

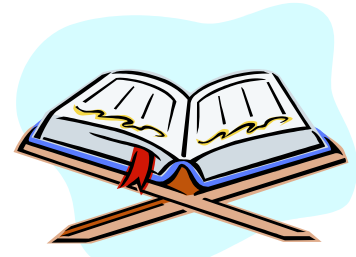


Means a MWPF that:

- Meets the numerical standards.
- Is evaluated & becomes certified.
- Is annually evaluated & stays certified.
- Is deemed comparable to source separation.
- Can offer MCR compliant services to businesses.



“Numerical standards”



Standard #1 = A minimum recovery rate for selected recyclable materials.



Percentage of selected materials recovered from the total amount of selected materials accepted.

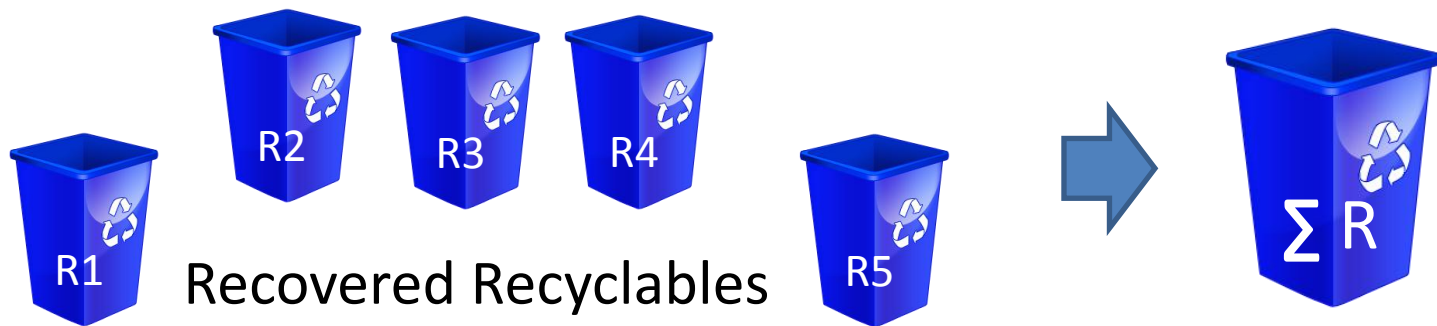
Standard #2 = A maximum level of unrecovered recyclables in residue.

Percentage of aggregate unrecovered recyclables still in recoverable condition left in MWPF residue.

“Aggregate selected materials recovered”



Means the total weight of materials on the selected materials list that are recovered by the MWPF for use as products or feedstock for recycling or composting. *Used in numerical standard #1.*



“Aggregate selected materials recovery rate”



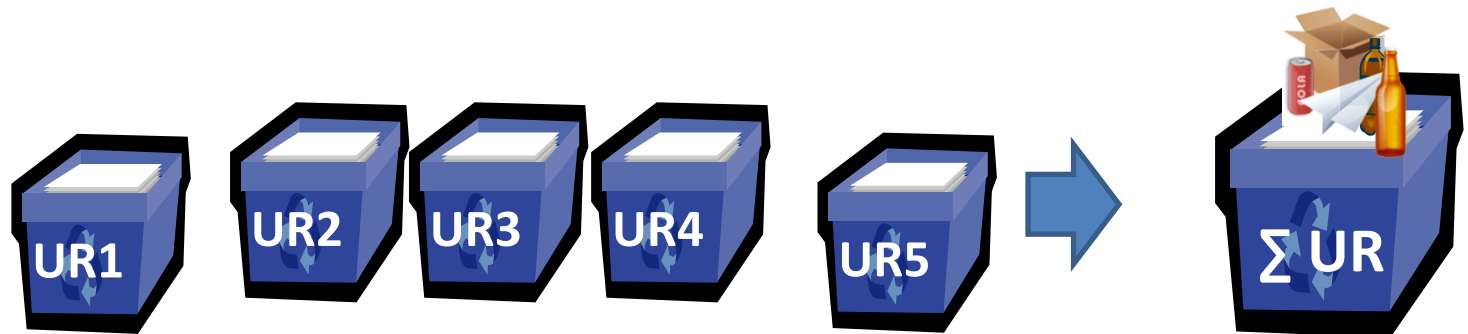
Means the percentage of selected materials recovered from the total amount of selected materials accepted (recovered + unrecovered in recoverable condition). *Used in numerical standard #1.*

$$\frac{\text{Selected Materials Recovered}}{\text{All Selected Materials Accepted}} \times 100 = \text{Aggregate selected materials recovery rate}$$

“Aggregated unrecovered recyclables”



Means the total weight of materials on the selected materials list that are in recoverable condition in a MWPF's residuals. *Used in both numerical standards.*



“Aggregate unrecovered recyclables rate”



Means the percentage of aggregate unrecovered recyclables still in recoverable condition left in MWPF residue. *Used in numerical standard #2.*

$$\frac{\text{Unrecovered Selected Materials}}{\text{All Residual Disposal}} \times 100 = \text{Aggregate Unrecovered Recyclables Rate}$$

“Selected materials list”



The following in recoverable condition:

- Aluminum & Tin/Steel Cans.
- HDPE & PETE Containers & 3-7 Plastic Containers.
- Newspaper, White Ledger Paper, Mixed Paper, & Uncoated Corrugated Cardboard.
- Glass Bottles & Containers.



“Recoverable condition”



Means Material:

- In a form that could be recovered for use as products or feedstock in recycling or composting.
- Is not too contaminated.
- Is not too small (2” minus).
- Is not part of a mixed-material product that is impractical to disassemble.
- Is acceptable for sale if a sufficient market exists.

“Residual”



Solid waste destined for a landfill or transformation facility, or further transfer/processing which remains after processing has taken place at the MWPF.

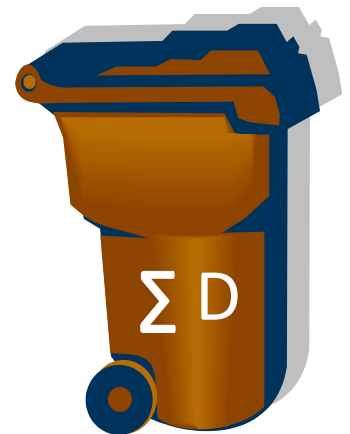
Materials that are recovered for use as products or feedstock in recycling or composting are not residuals.

“Total residual disposal”



All residuals from any part of the MWPF:

- At the beginning of line
- Rejected & ejected materials
- At the end of the line
- Waste fines
- Any other sources



“HP-MWPF evaluator”



An accredited, independent evaluator, hired by a MWPF, that conducts the initial and annual evaluations of a MWPF to determine if the “numerical standard” is being met.



“Independent” means an individual or organization not directly or indirectly affiliated with CalRecycle, the LEA, or the MWPF being evaluated other than for the evaluation.



Issues for the Definitions



What should be on the selected materials list:

- ✓ Criteria = commonly source separated & recycled, markets established, recovered by MWPFs.
- ✓ If new law mandates Mandatory Commercial Organics Recycling, then organics added to list.
- ✓ Could adapt Federal Trade Commission “Green Guides” standard for recyclable: List if substantial majority (at least 60%) of MWPFs recover material.
- ✓ Re-evaluate in 2020.



Issues for the Definitions



- ✓ Address complexities of multi-lined “MWPFs.”
- ✓ Address complexities of “source separation.”
- ✓ Should “selected materials list” be one size fits all.
- ✓ Refining definition of “recoverable condition” (need for 2014 Waste Characterization Study).
- ✓ Determining types of facilities to be in or out.
- ✓ Counting feedstock for ADC as residual or product.
- ✓ Counting feedstock for thermal processes as residual or product.
- ✓ Other?



Issues for the Definitions



- ✓ To protect proprietary information, only the aggregate rates will be reported not the amounts (or %) of constituent material types. Does this level of reporting provide enough information for determining comparability?



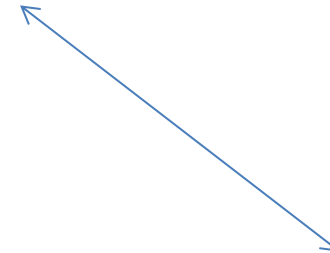
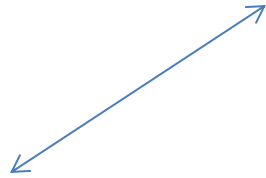
B. Certifying HP-MWPFs.

How will everyone know which
MWPFs are comparable to source
separation?

HP-MWPF Certification



CalRecycle 
(Or 3rd Party)



Initial Evaluation &
Meets Standard

Getting Certified

Annual
Evaluation
& Meets
Standard



Staying Certified



1. “Getting certified”

For a MWPF to become certified as a HP-MWPF, it must:

- Be evaluated by an accredited HP-MWPF evaluator (at own expense).
- Meet the numerical standards.
- Submit results to CalRecycle (or third party accreditor) for approval.



2. “Staying certified”

To maintain certification as a HP-MWPF, a MWPF must:

- Annually be evaluated by an accredited HP-MWPF evaluator (at own expense).
- Continue to meet the numerical standards.
- Submit summary of results annually to CalRecycle (or third party accreditor).

3. “HP-MWPF evaluation”



An HP-MWPF evaluation will be:

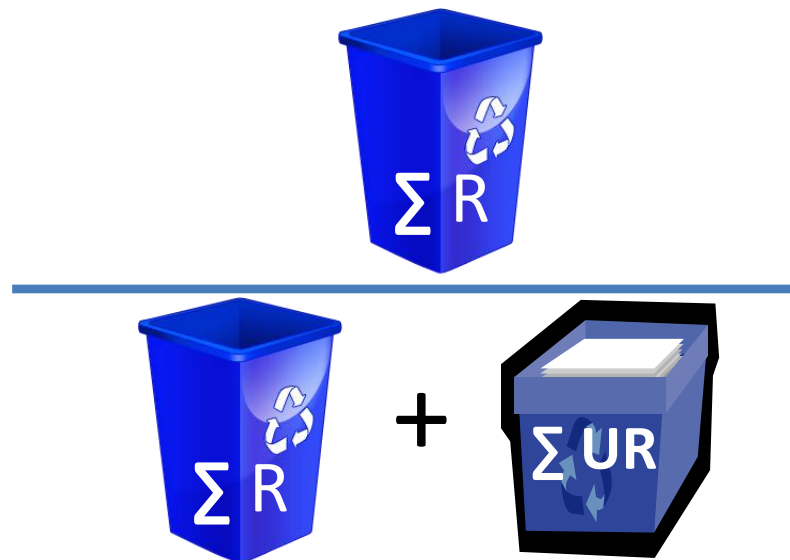
- Conducted at the expense of the MWPF by an independent, accredited evaluator.
- To determine whether the two numerical standards are being met, as detailed on the next two slides.

3a. “HP-MWPF evaluation”



For numerical standard #1, an HP-MWPF evaluation will determine:

- The aggregate recovered recyclables.
- The aggregate unrecovered recyclables.
- The selected materials recovery rate.

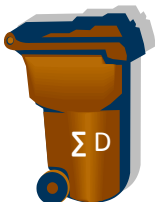




$\times 100 =$ Aggregate
Selected
materials
recovery
rate

3b. “HP-MWPF evaluation”



For numerical standard #2, an HP-MWPF evaluation will determine:

- The total residual for disposal. 
- The aggregate unrecovered recyclables. 
- The aggregate unrecovered recyclables rate.

$$\frac{\text{Aggregate Unrecovered Recyclables} (\Sigma UR)}{\text{Total Residual for Disposal} (\Sigma D)} \times 100 = \text{Aggregate Unrecovered Recyclables Rate}$$


4. “Losing certification”



CalRecycle may decertify a HP-MWPF who:

- Fails to submit yearly evaluation results.
- Fails to meet the standards & does not pass retest in following three months.
- Refuses to allow CalRecycle (or 3rd Party Certifier) to conduct onsite reviews, if needed to confirm results or address complaints.



5. “Waivers”



CalRecycle may grant a temporary waiver for:

- A “temporary, unforeseeable emergency.”
- A “Declared Disaster.”
- A “Market Collapse” for any listed materials.

CalRecycle shall not grant a waiver due to:

- Competitive market changes.
- Normal fluctuations in market demands/prices.
- Failure to plan for reasonably foreseeable events.



Issues for Certifying



Someone needs to approve or “accredit” the independent HP-Evaluator.

Some Options:

1. The best option is likely the ANSI-ASQ National Accreditation Board (ANAB) - the organization that accredits certifying bodies in the United States.
2. Alternatively, CalRecycle could approve them.
3. Finally, the industry could identify an appropriate body.



Issues for Certifying



- ✓ Proposal has third party evaluator (& accreditor), with CalRecycle involvement to investigate/confirm results if problems arise.
- ✓ Should CalRecycle, Local Enforcement Agencies or local governments have a more direct role in on-site review, periodic inspections, or other activity?
- ✓ CalRecycle role for resolving disputes between MWPFs and evaluators?



Issues for Certifying



Evaluator accreditation could require:

- 5 years of experience in solid waste and material recovery facilities.
- Complete training on program.
- Understanding of requirements.
- No conflict of interest.
- Conduct one test evaluation & submit results.
- Certify under penalty of perjury that each evaluation is accurate and complete.





Issues for Certifying



- ✓ Balancing cost and needs.
- ✓ Making sure evaluators are independent.
- ✓ Frequency of re-evaluations.
- ✓ Status if meet one standard but not other.
- ✓ Defining waiver terms and process.
- ✓ More or different reporting requirements.
- ✓ Other?



C. Setting the Numerical Standards

How effective is commercial source separation in California and how does that translate into measurable standards?

Initial (2014-2016)

Numerical Standard #1



Aggregate Selected Material Recovery Rate of at least 50%. At least half of the selected materials in recoverable condition must be recovered.

- CalRecycle's 2008 Waste Characterization Study showed that at least 50% of the selected materials in the commercial sector was still recoverable when it arrived at the disposal facility.

Initial (2014-2016)



Numerical Standard #2

Aggregate Unrecovered Recyclables Rate of no more than 9%. Residuals cannot contain more than 9% of selected materials in recoverable condition.

- CalRecycle's 2008 Waste Characterization Study showed the commercial sector contained 15% of the selected materials with at least 50% still recoverable when it arrived for disposal.
- Adding a 25% buffer yields 9%.

$$(15\% \times 0.5)(1.25) = 9.3\%$$

Resetting the Standards in 2017



Use:

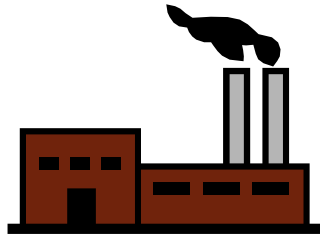
- The results of the 2014 Waste Characterization Study's assessment of the statewide efficiency of California's commercial sector source separation programs.
- Other information as available.

Data for the 2017 Standard

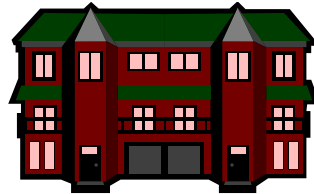


1. 2014 Characterization Sampling: 200+ representative, randomly selected businesses with recycling bin service.
2. Select samples from each bin (blue, green, black).
3. Weigh bins.
4. Sort bins into Garbage, Recyclables, & Organics.
5. Weigh all of the sorted groups.
6. Total all samples for recyclables, unrecovered recyclables, organics & disposal.
7. Determine the Statewide average for “Aggregate Selected Material Recovery Rate” and “Aggregate Unrecovered Recyclables Rate.”
8. Adjust the data & set the standards for MWPFs.

1. 200+ representative, randomly selected businesses.



Data collection from businesses with source separation bin service.



Representative of business types, geographically and seasonally.



Multi-family sites will also be included.

2. Select samples from each bin.



Outside Study Boundaries



In-house source reduction or recycling programs

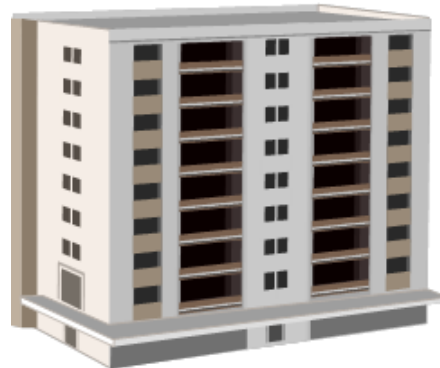


Back-hauling



Independent Salvaging

Only materials in bins (RIGHT) = included.



Other activities (LEFT) happen at businesses with or without Source Separation = not included.

Within Study Boundaries



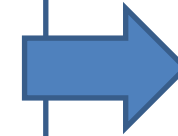
Blue Bin: Recyclables



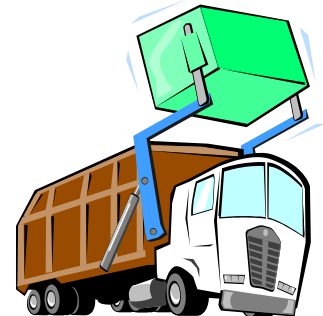
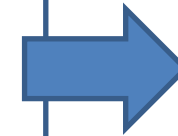
Green Bin: Organics



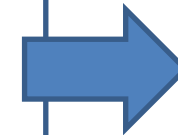
Black Bin: Garbage



To Recycling

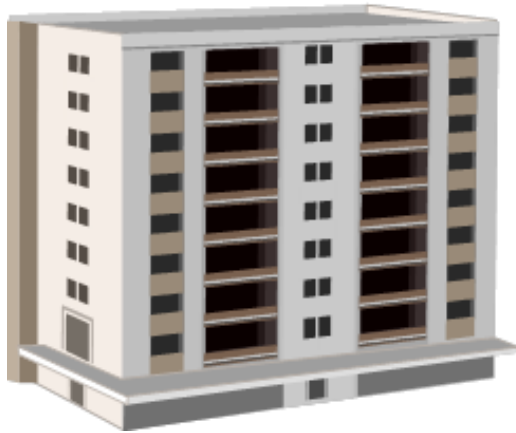


To Composting



To Disposal

3. Weigh bins.



Blue Bin:
Recyclables



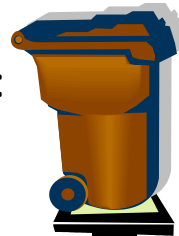
= Rec1

Green Bin:
Organics



= Org1

Black Bin:
Garbage



= Dis1

The Total Collected (TC) weight:

$$\mathbf{TC1} = \mathbf{Rec1} + \mathbf{Org1} + \mathbf{Dis1}$$

4. Sort bins into Garbage, Recyclables, & Compostable Organics.



Blue Bin:
Recyclables



SORT



Green Bin:
Organics



SORT



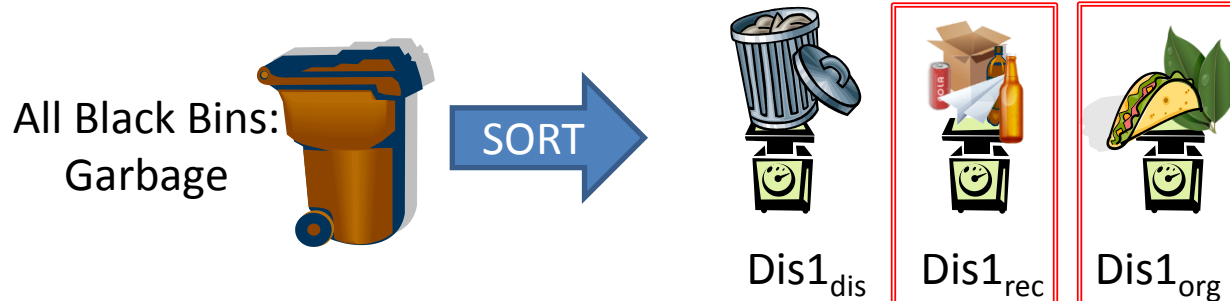
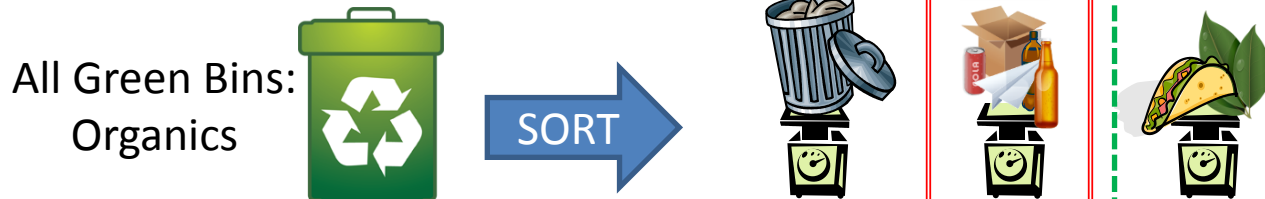
Black Bin:
Garbage



SORT



5. Weigh all of the sorted groups.




The blue and green boxes show the recyclables and compostables that are recovered.


The red boxes show recyclables and compostables that are left unrecovered.

6. Total all samples for recyclables, unrecovered recyclables, organics and disposal.






$\Sigma \text{Rec1}_{\text{rec}}$ = Recovered Recyclables




$\Sigma \text{Dis1}_{\text{rec}}$

+




$\Sigma \text{Org1}_{\text{rec}}$ = Unrecovered Recyclables in Disposal & Organics




Dis1_{dis}

+




Rec1_{dis}

+




Org1_{dis} = Disposal




$\Sigma \text{Dis1}_{\text{org}}$

+



$\Sigma \text{Rec1}_{\text{org}}$

+



$\Sigma \text{Org1}_{\text{org}}$ = Organics in all Bins



6. Simplified Example Data

Sorting Samples from All Bins at Generator 1

| 100 lb material generated at business site - Recycling, Composting & Waste | | | | |
|--|---------------------|--------------------------------------|----------------------------|-------------------------|
| | Step 3 (weigh bins) | Steps 4, 5 (sort & weigh components) | | |
| (All data in lb) | | | Recoverable Recyclables | Compostable Organics |
| | Total placed in bin | Garbage | | |
| Blue bin | 30 | 4 | 25 | 1 |
| Green bin | 10 | 1 | 1 | 8 |
| Black bin | 60 | 55 | 4 | 1 |

Blue bin: assume all recyclables recovered and no organics recovered at clean MRF.

Green bin: assume all organics recovered and no recyclables recovered at composter.

7a. Determine Raw Numerical Standard #1: Aggregate selected materials recovery rate.



Divide the recovered recyclables by the sum of all recyclables set out in any bin to get an estimate of the Statewide aggregate selected materials recovery rate in source separation systems.



+



+



Unrecovered
recyclables in
recoverable condition
in disposal and
organics bins plus
recovered recyclables

X 100% =

**Raw
Statewide
Average
Aggregate
Selected
Materials
Recovery
Rate**

7a. Simplified Calculation Example



Aggregate selected materials recovery rate.

| 100 lb material generated at business site - Recycling, Composting & Waste | | | | |
|--|---------------------|--------------------------------------|----------------------------|-------------------------|
| | Step 3 (weigh bins) | Steps 4, 5 (sort & weigh components) | | |
| (All data in lb) | | | Recoverable Recyclables | Compostable Organics |
| | Total placed in bin | Garbage | | |
| Blue bin | 30 | 4 | 25 | 1 |
| Green bin | 10 | 1 | 1 | 8 |
| Black bin | 60 | 55 | 4 | 1 |

Raw

Aggregate

Selected

Materials

Recovery

Rate

$$= \frac{25}{1 + 4 + 25} \times 100\% = 83.3\%$$

7b. Determine Raw Numerical Standard #2: Aggregate unrecovered recyclables rate.

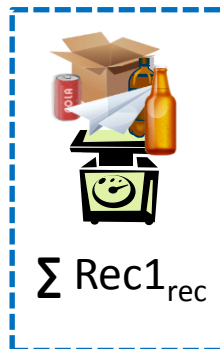
Divide the unrecovered recyclables by the total set out to get an estimate of the statewide average for unrecovered recyclables for source separation systems.



+



Unrecovered
recyclables in
recoverable condition
in disposal and
organics Bins

$$\Sigma \text{TC1} -$$


Everything collected minus recovered recyclables

**Raw
Statewide
Average
Aggregate
Unrecovered
Recyclables
Rate**

X 100% =

7b. Simplified Calculation Example

Aggregate Unrecovered Recyclables Rate.



| 100 lb material generated at business site - Recycling, Composting & Waste | | | | |
|--|---------------------|--------------------------------------|----------------------------|-------------------------|
| | Step 3 (weigh bins) | Steps 4, 5 (sort & weigh components) | | |
| (All data in lb) | | | Recoverable Recyclables | Compostable Organics |
| | Total placed in bin | Garbage | | |
| Blue bin | 30 | 4 | 25 | 1 |
| Green bin | 10 | 1 | 1 | 8 |
| Black bin | 60 | 55 | 4 | 1 |

Raw
Aggregate
Unrecovered
Recyclables
Rate

$$= \frac{1 + 4}{100 - 25} \times 100\% = 6.7\%$$

8a. Adjust the data and set Numerical Standard #1.



The standard must account for:

- Loss of some recyclables at clean MRFs,
- Variation between source separation systems, &
- “Comparable to” does not mean “equal to”.

The raw statewide average is adjusted downward by 25% to yield Standard #1.

Raw Statewide
Average
Aggregate
Selected Materials
Recovery Rate

X 0.75
(equals a 25%
adjustment)

= Aggregate Selected
Materials Recovery Rate
STANDARD #1

8a. Simplified Calculation Example



Aggregate Selected Materials Recovery Rate

The raw statewide average is adjusted downward by 25% to yield Standard #1.

$$\begin{array}{l} \text{Raw Aggregate} \\ \text{Selected Materials} \\ \text{Recovery Rate} \end{array} \times \begin{array}{c} 0.75 \\ \text{(equals a 25\%} \\ \text{adjustment)} \end{array} = \begin{array}{l} \text{Aggregate Selected} \\ \text{Materials Recovery Rate} \\ \text{STANDARD \#1} \end{array}$$

$$83.3\% \times 0.75 = 62.5\%*$$

*Fictitious example if standard based only on imaginary “Generator 1.”

8b. Adjust the data and set Numerical Standard #2.



The standard must account for:

- Loss of some recyclables at clean MRFs,
- Variation between source separation systems, &
- “Comparable to” does not mean “equal to”.

The raw statewide average is adjusted upward by 25% to yield Standard #2.

$$\begin{array}{l} \text{Raw Statewide} \\ \text{Average} \\ \text{Aggregate} \\ \text{Unrecovered} \\ \text{Recyclables Rate} \end{array} \times 1.25 \quad \begin{array}{l} \text{(equals a 25\%} \\ \text{adjustment)} \end{array} = \begin{array}{l} \text{Aggregate Unrecovered} \\ \text{Recyclables Rate} \\ \text{STANDARD \#2} \end{array}$$

8b. Simplified Calculation Example



Aggregate Unrecovered Recyclables Rate

The raw statewide average is adjusted upward by 25% to yield Standard #2.

| | | | | |
|--|---|--------------------------------------|---|--|
| Raw Aggregate Unrecovered Recyclables Rate | X | 1.25 (equals a 25% adjustment) | = | Aggregate Unrecovered Recyclables Rate STANDARD #2 |
|--|---|--------------------------------------|---|--|

$$6.7\% \times 1.25 = 8.3\%*$$

*Fictitious example if standard based only on imaginary “Generator 1.”



Re-evaluating the Standards

In 2020, CalRecycle could re-evaluate the standards with any changes effective starting on January 1, 2022.



Issues for the Standards



- Could include different materials.
- Could vary standards due to regional, market, waste shed differences, or rural/urban differences.
- Could adjust raw percentages more or less.
- Could use other data to set standards.
- Other?



D. An Evaluation Method for the Standards

Which Mixed Waste Processing Facilities meet both numerical standards?

How could evaluation be done?

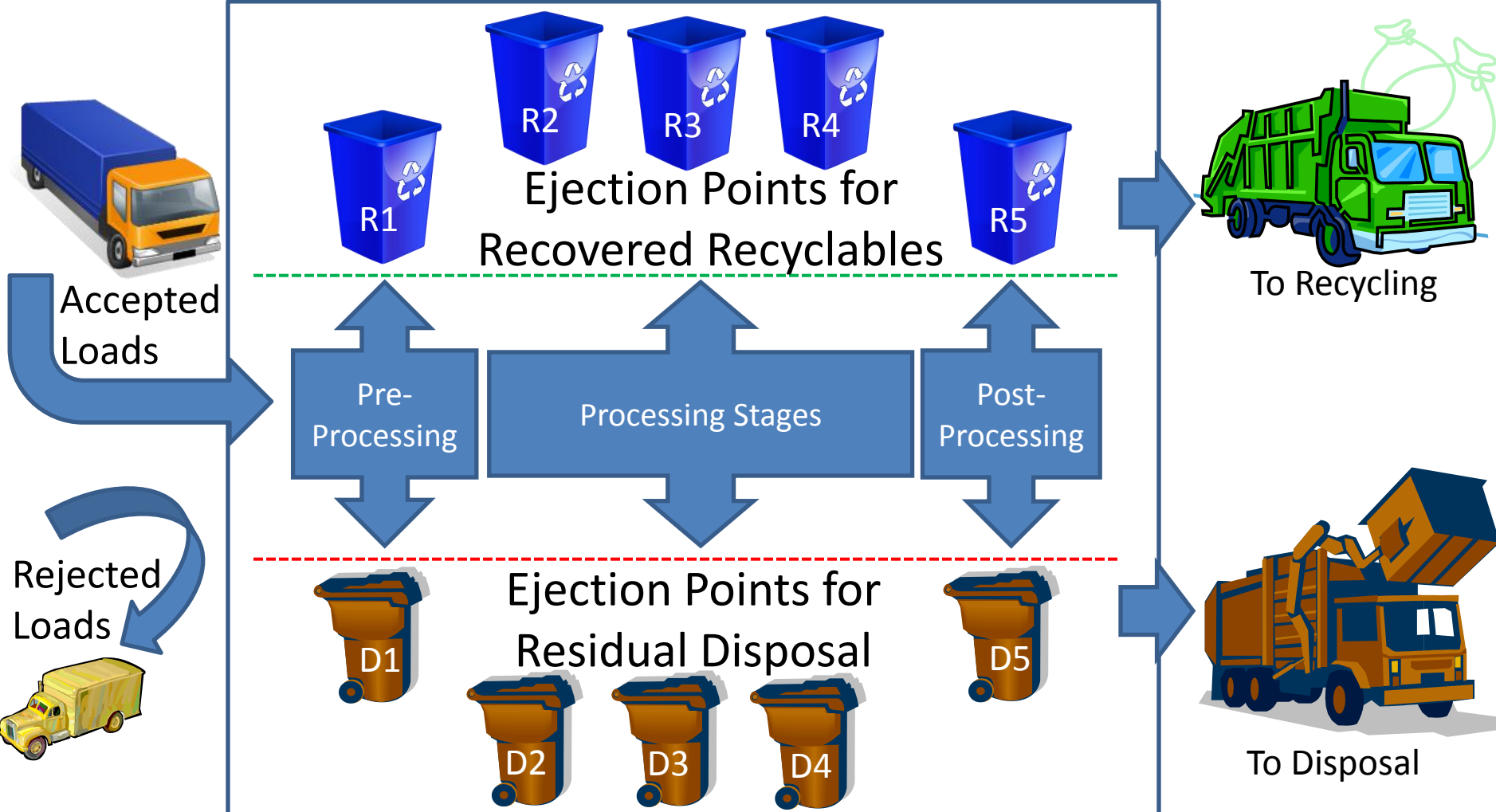


1. Identify all ejection points for recyclables & residuals.
2. Collect & weigh all recyclables & residuals from each ejection point for a certain amount of material processed (or certain sampling period).
3. Sort residuals to separate unrecovered recyclables.
4. Weigh the aggregate unrecovered recyclables.
5. Divide the aggregate selected materials recovered tons by the total selected materials accepted tons to yield the rate for standard #1
6. Divide the aggregate unrecovered recyclables tons by the total residual tons to yield the rate for standard #2.
7. Determine if standards have been met.

1. Identify all ejection points for recyclables & residual disposal.



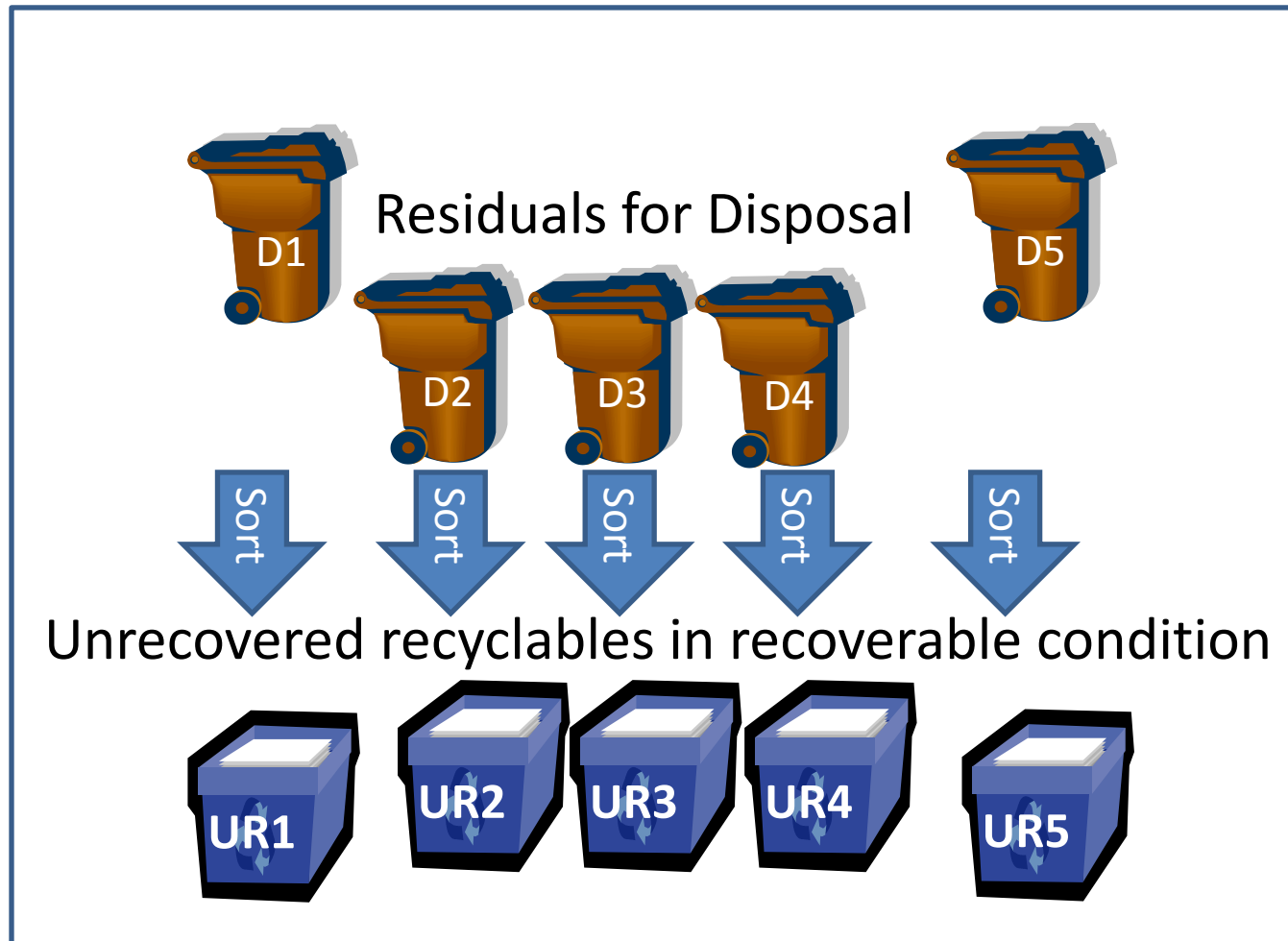
Mixed Waste Processing Facility Boundary



2. Collect & weigh recyclables & residuals from each ejection point.



3. Sort the residuals to separate unrecovered recyclables.



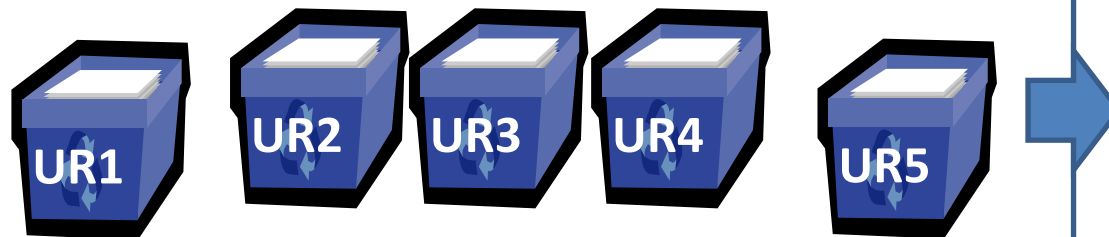
4. Weigh the aggregate unrecovered recyclables.



To protect proprietary information:

- Record only total tonnage of aggregate unrecovered recyclables.
- Do not record each constituent material.

Unrecovered recyclables in recoverable condition



$$UR1 + UR2 + UR3 + UR4 + UR5 = \Sigma UR = \text{Total Unrecovered (tons)}$$

5. Calculate the aggregate selected materials recovery rate



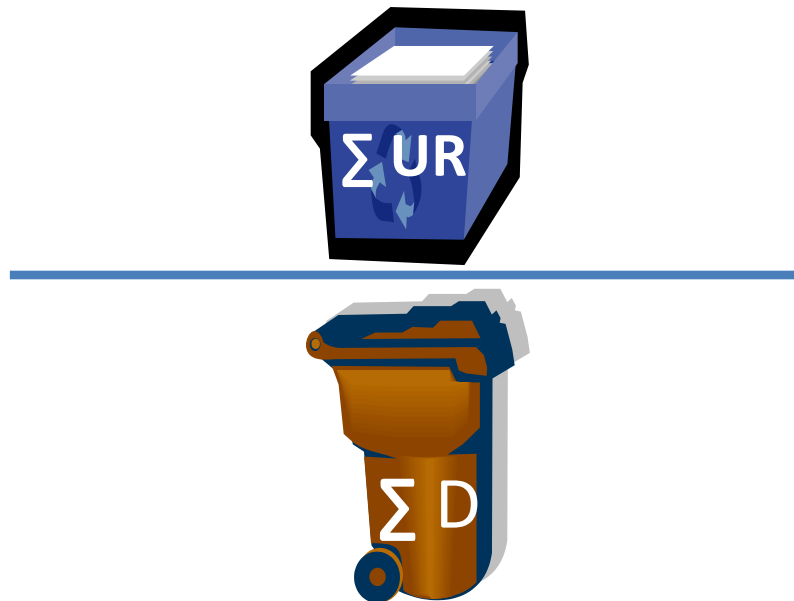
Divide the aggregate selected materials recovered tons by the total selected materials accepted tons to yield the rate for standard #1.

$$\frac{\text{Aggregate Selected Materials Recovered (\Sigma R)}}{\text{Total Selected Materials Accepted (\Sigma R + \Sigma UR)}} \times 100 = \text{Aggregate selected materials recovery rate (\%)}$$



6. Calculate the aggregate unrecovered recyclables rate.

Divide the aggregate unrecovered recyclables tons by the total residual tons to yield the rate for standard #2.


$$\frac{\Sigma UR}{\Sigma D} \times 100 = \text{Aggregate unrecovered recyclables rate (\%)}$$

7a. If the aggregate selected materials recovery rate is equal to or greater than the standard, then standard #1 met.



58% > 50%*

Measured Aggregate
Selected Materials Recovery
Rate (%)

Standard for Aggregate
Selected Materials Recovery
Rate (%)



41% < 50%*

Measured Aggregate
Selected Materials Recovery
Rate (%)

Standard for Aggregate
Selected Materials Recovery
Rate (%)

*Proposed initial standard = 50%

7b. If the aggregated unrecovered recyclables rate is equal to or less than the standard, then standard #2 met.



8%

<

9%*

Measured Aggregate
Unrecovered
Recyclables (%)

Standard for Aggregate
Unrecovered
Recyclables (%)



10%

>

9%*

Measured Aggregate
Unrecovered
Recyclables (%)

Standard for Aggregate
Unrecovered
Recyclables (%)

*Proposed initial standard = 9%



Issues for evaluations



Additional requirements:

- ✓ Unannounced.
- ✓ Random & representative of all ejection points.
- ✓ During sampling, sources should be mostly commercial & multi-family, but not required to turn other trucks away.
- ✓ No changes in operation because of, or during, evaluation period (e.g. line speed, staffing, equipment, etc.).



Issues for evaluations



- ✓ Address residuals sent for additional processing.
- ✓ Evaluation frequency (one size fits all or not).
- ✓ Complimentary reporting under PRC 41821.5 (b).
- ✓ “Extra Credit” for additional materials recovered.
- ✓ Segregate commercial & multi-family stream for sampling.
- ✓ Ways to minimize any unnecessary costs.
- ✓ Other?



An endnote:

- We need to address “comparable” issue.
- Our proposal is one way to do it.
- Let’s edit it and make it work.
- Nothing (materials, rates, etc.) set in stone.
- Plenty of time to get it right.
- Now we need your input.



Questions? Feedback?



Please submit additional comments to:

MRFFStandards@CalRecycle.ca.gov